

What is claimed is:

- 1 1. A system to monitor performance, comprising:
2 at least one probe to collect data related to performance of an associated
3 domain; and
4 at least one base station to receive data from associated ones of the at least
5 one probe.
- 1 2. The system of claim 1, wherein the at least one probe comprises a system probe
2 to gather at least one of operating system data, network data and performance data related
3 to operation of an associated host processor.
- 1 3. The system of claim 2 wherein the system probe comprises a data structure to
2 gather kernel data.
- 1 4. The system of claim 3, wherein the system probe comprises a data structure to
2 gather data in a single process address by taking a snapshot of a kernel image at a selected
3 time interval and to categorize the data.
- 1 5. The system of claim 2, wherein the system probe comprises a Java Native
2 Interface to gather data.
- 1 6. The system of claim 2, wherein the system probe transmits data to an associated
2 base station using Transmission Control Protocol.
- 1 7. The system of claim 2, wherein the at least one base station transmits signals to
2 an associated system probe using User Datagram Protocol.
- 1 8. The system of claim 1, wherein the at least one probe comprises at least one
2 application probe associated with an application.

1 9. The system of claim 8, wherein each application probe and an associated base
2 station communicate using User Datagram Protocol.

1 10. The system of claim 8, further comprising a queue to store data collected by
2 the at least one application probe until transferred to an associated base station.

1 11. The system of claim 10, wherein the queue comprises a circular queue of a
2 predetermined capacity.

1 12. The system of claim 10, wherein the base station comprises a data structure to
2 request transfer of any data stored in the queue and any data is transferred during time
3 periods of internal host processor resource utilization that is below a predetermined level.

1 13. The system of claim 10, further comprising a Java Virtual Machine on which
2 the queue resides.

1 14. The system of claim 10, wherein the stored data is transferred to the base
2 station on a low priority thread relative to normal operations of a host processor.

1 15. The system of claim 1, wherein each probe is dynamically controlled by an
2 associated base station using User Datagram Protocol.

1 16. The system of claim 1, wherein each probe is dynamically controlled to alter at
2 least a type of performance data being collected and a frequency at which the data is being
3 collected without affecting operation of the associated domain.

1 17. The system of claim 1, wherein each probe comprises a control module
2 including user selectable parameters for controlling operation of each probe.

1 18. The system of claim 17, wherein the base station comprises a copy of the
2 control module associated with each probe served by the base station, wherein the control
3 module and copy are updated each time a user selects a new parameter.

1 19. The system of claim 1, wherein the base station comprises a data structure to
2 periodically ping each probe served by the base station to check a status of the probe and
3 wherein the probe transmits its current control module information in response to the ping.

1 20. The system of claim 1, further comprising performance gathering code in a
2 source code or a byte code associated with each domain to be monitored by an associated
3 one of the at least one probe.

1 21. The system of claim 1, wherein the at least one probe comprises a network
2 probe associated with each host processor to gather network data.

1 22. The system of claim 1, wherein the at least one probe comprises a data
2 structure written in a Java® programming language.

1 23. The system of claim 1, wherein the base station comprises a data collector to
2 collect data from the at least one probe.

1 24. The system of claim 23, further comprising at least one relational database to
2 store data from the data collector.

1 25. The system of claim 24, wherein the collected data is stored in relation to a
2 time interval in the at least one relational database.

1 26. The system of claim 1, further comprising:
2 a plurality of base stations; and
3 a negotiator to balance a quantity of probes served by each base station.

1 27. The system of claim 1, further comprising a plurality of base stations, wherein
2 each base station comprises a probe table and wherein the probe table includes a list of
3 probe identifications and an associated probe control module for each probe served by the
4 base station.

1 28. The system of claim 1, further comprising:
2 a server to interface between a browser and the at least one base station;
3 and
4 a data structure to run on the server to retrieve and display selected data in
5 response to a query.

1 29. The system of claim 28, further comprising an interoperable naming service to
2 register each base station and to assign a unique identifier associated with each base
3 station in response to the base station becoming active.

1 30. The system of claim 28, further comprising a probes application to run on the
2 server to control operation of the at least one probe and to retrieve and display the selected
3 data from collected data in response to the query.

1 31. The system of claim 30, wherein the probes application runs on a Java Server
2 Page (JSP) engine.

1 32. The system of claim 28, further comprising a file to store predetermined
2 queries to retrieve selected data from the collected data.

1 33. The system of claim 32, wherein the file comprises predetermined structured
2 query language (SQL) queries to retrieve the selected data from a relational database.

1 34. The system of claim 32, wherein the file comprises predetermined mark-up
2 language queries to retrieve the selected data from a relational database.

1 35. The system of claim 32, further comprising a data structure to substitute
2 parameters entered by a user into a chosen query to retrieve the selected data.

1 36. The system of claim 32, further comprising a data structure to provide a link
2 on a web page to a universal resource locator containing a path to a chosen query in the
3 file in response to parameters selected or entered by a user on the web page.

1 37. The system of claim 1, further comprising a data structure to display collected
2 data related to performance from one or more domains together.

1 38. The system of claim 1, further comprising a data structure to periodically
2 retrieve updated data related to performance for one or more domains and to display the
3 updated data.

1 39. The system of claim 38, further comprising an image streaming servlet to
2 display the updated data.

1 40. The system of claim 1, further comprising a data structure to select parameters
2 for retrieving data by the at least one probe.

1 41. The system of claim 40, wherein the parameters may be dynamically altered
2 without affecting operation of the associated domain.

1 42. The system of claim 1, wherein the at least one probe releases any resources
2 utilizable by the probe in response to the probe being unable to associate with the at least
3 one base station.

1 43. The system of claim 1, further comprising a plurality of probes each to collect
2 data related to performance of a different domain within a distributed enterprise system.

1 44. A system to monitor performance, comprising:
2 at least one probe of a plurality of probes to collect data related to
3 performance from each of a plurality of domains;
4 at least one base station to receive data from associated ones of the plurality
5 of probes and to control operation the probes associated with the base station;
6 at least one database to store the collected data; and
7 a server to interface between a browser and the at least one base station and
8 to retrieve and display selected data from the at least one database in response to a query.

1 45. The system of claim 44, further comprising a system probe associated with
2 each host processor domain to gather at least one of operating system data, network data
3 and performance data related to operation of the associated host processor.

1 46. The system of claim 45, wherein the system probe transmits data to an
2 associated base station using Transmission Control Protocol.

1 47. The system of claim 45, wherein the at least one base station transmits signals
2 to an associated system probe using User Datagram Protocol.

1 48. The system of claim 44, further comprising at least one application probe
2 associated with each application of a plurality of applications.

1 49. The system of claim 48, wherein each application probe and an associated
2 base station communicate using User Datagram Protocol.

1 50. The system of claim 48, further comprising a queue to store data collected by
2 the at least one application probe until transferred to an associated base station.

1 51. The system of claim 44, wherein each probe is dynamically controlled to alter
2 at least a type of performance data being collected and a frequency at which the data is
3 being collected without affecting operation of the associated domain.

1 52. The system of claim 44, wherein each probe comprises a control module
2 including user selectable parameters for controlling operation of each probe.

1 53. The system of claim 44, wherein the at least one base station comprises a data
2 collector to collect data from the at least one probe.

1 54. The system of claim 53, further comprising at least one relational database to
2 store data from the data collector.

1 55. The system of claim 54, wherein the data is stored with an associated time
2 stamp.

1 56. The system of claim 44, further comprising:
2 a plurality of base stations; and
3 a negotiator to balance a quantity of probes served by each base station.

1 57. The system of claim 44, further comprising a plurality of base stations,
2 wherein each base station comprises a probe table and wherein the probe table includes a
3 list of probe identifications and an associated probe control module for each probe served
4 by the base station.

1 58. The system of claim 44, further comprising:
2 a plurality of base stations; and

3 an interoperability naming service to register each base station and to
4 assign a unique identifier associated with each base station in response to the base station
5 becoming active to service probes.

1 59. The system of claim 44, further comprising a probes application to run on the
2 server to control operation of each of the probes and to display at least some of the
3 collected data.

1 60. The system of claim 44, further comprising a data structure to display at least
2 some of the collected data for different domains together for a common time period.

1 61. The system of claim 44, further comprising a file to store predetermined
2 queries to retrieve the selected data from the database for a predetermined time interval.

1 62. The system of claim 61, further comprising a data structure to substitute
2 parameters entered by a user into a chosen query to retrieve the selected data.

1 63. The system of claim 62, further comprising a data structure to display the
2 selected data over the predetermined time interval.

1 63. The system of claim 62, further comprising a data structure to periodically
2 retrieve updated data related to the query and to display the update data.

1 64. The system of claim 44, wherein each of the probes self-destructs and releases
2 any resources utilizable by the probe in response to the probe being unable to bootstrap to
3 an appropriate base station for a configuration of the probe.

1 65. A method to monitor performance, comprising:
2 collecting data related to performance of different domains in a system;

3 correlating the data collected from each of the different domains over a
4 common time period; and
5 displaying the data collected for selected ones of the different domains
6 together in relation to the common time period.

1 66. The method of claim 65, further comprising instrumenting each different
2 domain to be monitored.

1 67. The method of claim 66, wherein instrumenting comprises inserting
2 performance gathering code into one of source code or byte code of each of the different
3 domains to be monitored.

1 68. The method of claim 65, wherein collecting data comprises embedding at least
2 one probe in each domain to be monitored.

1 69. The method of claim 68, further comprising embedding a system probe into
2 each operating system to gather at least one of operating system data, network data and
3 performance data related to operation of a host processor on which the operating system is
4 operable.

1 70. The method of claim 69, wherein embedding the system probe comprises
2 providing the system probe in a Java® programming language.

1 71. The method of claim 68, further comprising embedding at least one
2 application probe in each application to gather data related to performance of the
3 application.

1 72. The method of claim 71, wherein embedding at least one application probe
2 comprises providing the at least one application probe in a Java® programming language.

1 73. The method of claim 65, further comprising starting an interoperable naming
2 service on a server in response to accessing a data structure on the server to monitor
3 performance of different domains in the system.

1 74. The method of claim 73, further comprising using a browser to access the data
2 structure.

1 75. The method of claim 73, further comprising starting at least one base station in
2 response to accessing the data structure.

1 76. The method of claim 75, further comprising:
2 registering each base station with the interoperable naming service; and
3 connecting each base station to at least one database.

1 77. The method of claim 65, further comprising:
2 activating a system probe in response to starting an associated operating
3 system on a host processor to collect at least one of operating system data, network data
4 and performance data related to operation of the associated host processor; and
5 activating at least one application probe in response to starting an
6 application associated with the at least one application probe to collect data related to
7 operation of the application.

1 78. The method of claim 77, further comprising searching for a negotiator by each
2 activated system probe and each activated application probe.

1 79. The method of claim 78, further comprising:
2 inactivating or self-destructing any probe in response to the probe not
3 receiving a response from a negotiator; and
4 releasing any resources associated with a inactivated or self-destructed
5 probe.

1 80. The method of claim 78, further comprising allocating a queue to store data
2 received from each application probe.

1 81. The method of claim 80, wherein allocating the queue comprises providing a
2 circular queue on a Java Virtual Machine.

1 82. The method of claim 81, wherein the Java Virtual Machine is operable on a
2 host processor on which the application associated with the at least one application probe
3 runs to collect data.

1 83. The method of claim 78, further comprising performing a handshaking
2 operation between each available base station and each activated probe in response to the
3 activated probe being associated with the base station.

1 84. The method of claim 78, further comprising storing a probe identifier and an
2 control module for each activated probe served by any available base station.

1 85. The method of claim 84, further comprising:
2 transmitting a status request signal from the base station to each probe
3 served by the base station at predetermined time intervals; and
4 transmitting a message from each probe corresponding to the probe's
5 control module in response to receiving the status request signal.

1 86. The method of claim 77, further comprising operating each of the probes in a
2 parallel mode on separate threads to gather performance data until operation is terminated.

1 87. The method of claim 77, wherein each system probe gathers data in a single
2 process address by taking a snapshot of a kernel image at a selected time interval.

1 88. The method of claim 77, further comprising transmitting data from each
2 system probe to an associated base station using Transmission Control Protocol.

1 89. The method of claim 77, further comprising transmitting signals from a base
2 station to each associated system probe using User Datagram Protocol.

1 90. The method of claim 77, further comprising balancing a quantity of probes
2 served between each of a plurality of base stations.

1 91. The method of claim 77, further comprising presenting a control page to a user
2 to dynamically control operation each probe without affecting operation of an associated
3 domain.

1 92. The method of claim 77, further comprising dynamically controlling a type of
2 performance data collected and frequency of collecting the performance data by each
3 probe without affecting operation of an associated domain.

1 93. The method of claim 65, further comprising accessing a probes application on
2 a server to start the probes application to retrieve performance data of different domains in
3 a system or network.

1 94. The method of claim 93, further comprising presenting at least one parameter
2 selection page for a user to select parameters related to performance of the different
3 domains.

1 95. The method of claim 94, wherein presenting the at least one parameter
2 selection page comprises presenting a form for the user to enter or select a time interval
3 over which performance data is desired.

1 96. The method of claim 94, wherein presenting the at least one parameter
2 selection page comprises presenting a form for the user to enter or select at least one host
3 or domain for which performance data is desired.

1 97. The method of claim 94, wherein presenting the at least one parameter
2 selection page comprises presenting a form for the user to enter or select at least one class
3 of performance data desired.

1 98. The method of claim 94, further comprising choosing an appropriate raw
2 query in response to the selected parameters.

1 99. The method of claim 98, further comprising substituting the selected
2 parameters into the raw query.

1 100. The method of claim 99, further comprising converting the raw query to a
2 structured query language (SQL) query.

1 101. The method of claim 99, further comprising executing the query on at least
2 one appropriate database to retrieve the performance data corresponding to the query.

1 102. The method of claim 101, further comprising presenting the results of the
2 query.

1 103. The method of claim 102, wherein presenting the results comprises
2 presenting performance data for multiple different domains together for the selected or
3 entered time interval.

1 104. The method of claim 102, wherein presenting the results comprises
2 presenting a graphical representation of the results.

1 105. The method of claim 104, further comprising updating the graphical
2 representation at predetermined time intervals.

1 106. The method of claim 105, wherein updating the graphical representation
2 comprises re-executing the query and re-drawing the graphical representation in response
3 to the new results.

1 107. A method to monitor performance, comprising:
2 accessing a probes application on a server via a browser to activate the
3 probes application;
4 presenting at least one parameter selection page for a user to select
5 parameters related to performance data in response to accessing the probes application;
6 and
7 retrieving performance data in response to the selected parameters.

1 108. The method of claim 107, further comprising choosing an appropriate query
2 in response to the selected parameters.

1 109. The method of claim 108, further comprising executing the query on at least
2 one database to retrieve the performance data corresponding to the query.

1 110. The method of claim 109, further comprising presenting the performance
2 data.

1 111. The method of claim 110, further comprising:
2 updating the performance data at predetermined time intervals by re-
3 executing the query; and
4 presenting the new performance data.

1 112. A computer-readable medium having computer-executable instructions for
2 performing a method, comprising:

3 collecting performance data for different domains in a system;
4 correlating the data collected from each of the different domains over a
5 common time period; and
6 displaying the data collected for selected ones of the different domains
7 together in relation to the common time period.

1 113. The computer-readable medium having computer-executable instructions for
2 performing the method of claim 112, further comprising:

3 activating a system probe in response to starting an associated operating
4 system on a host processor to collect at least one of operating system data, network data
5 and performance data related to operation of the associated host processor; and
6 activating at least one application probe in response to starting an
7 application associated with the at least one application probe to collect data related to
8 operation of the application.

1 114. The computer-readable medium having computer-executable instructions for
2 performing the method of claim 113, further comprising dynamically controlling a type of
3 performance data collected and frequency of collecting the performance data by each
4 probe without affecting operation of the associated domain.

1 115. The computer-readable medium having computer-executable instructions for
2 performing the method of claim 112, further comprising choosing an appropriate query in
3 response to parameters selected by a user to retrieve performance data from a database.

1 116. The computer-readable medium having computer-executable instructions for
2 performing the method of claim 115, further comprising:

3 updating the performance data at predetermined time intervals by re-
4 executing the query; and
5 presenting the new performance data retrieved.

1 117. A method of making a system to monitor performance, comprising:
2 embedding a plurality of probes, at least one probe being embedded with
3 each of a plurality of domains to collect performance data from the domain; and
4 providing at least one base station to receive data from associated ones of
5 the plurality of embedded probes.

1 118. The method of claim 117, wherein embedding the plurality of probes
2 comprises embedding a system probe in each host processor domain to gather at least one
3 of operating system data, network data and performance data related to operation of the
4 associated host processor.

1 119. The method of claim 117, wherein embedding the plurality of probes
2 comprises embedding at least one application probe in each application domain to collect
3 performance data related to operation of the application.

1 120. The method of claim 117, further comprising providing at least one database
2 to store the collected performance data.

1 121. The method of claim 120, further comprising providing a server to interface
2 between a browser and the at least one base station and to retrieve and display selected
3 data from the at least one database in response to a query.